

SHORT REPORT

Arterial Perforation (by Balloon) During Subintimal Angioplasty

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Introduction

Perforation complicates 3–4% of angioplasties and can be treated by temporary balloon occlusion, coil embolisation, placement of a covered stent or re-dissection past the perforation using the subintimal angioplasty technique.¹ Our unit has generally been reluctant to place covered stents in the infra-inguinal region, largely because of concerns about in-stent restenosis. Most perforations occurring during subintimal angioplasty (a modification of the traditional angioplasty technique) follow manipulation of the guide wire in the extra-luminal space. A relative minority occur during balloon inflation. It has previously been our experience that arterial perforation does not worsen outcome following angioplasty and we have, therefore, never recommended post-procedural ultrasound surveillance.

We report a case of a successfully treated perforation occurring during subintimal angioplasty. The perforation occurred during balloon insufflation of the subintimal channel and then presented secondarily with a large, symptomatic false aneurysm. Awareness of this case has led to a revision of our post-procedural surveillance strategy.

Report

An 80-year-old female underwent subintimal angio-

plasty of the superficial femoral artery for the treatment of critical ischaemia. During balloon inflation of the proximal subintimal channel, a localised perforation occurred (Fig. 1(a)). This was treated by temporary balloon tamponade. Completion angiography demonstrated good distal flow and confirmed sealing of the perforation (Fig. 1(b)).

She was readmitted 3 weeks later with an extensive deep vein thrombosis caused by compression of the superficial femoral vein by a large wide-necked false aneurysm (6 × 2 cm) arising 5 cm distal to the origin of the superficial femoral artery (Fig. 2(a)). This was not suitable for treatment by thrombin injection because of the very wide, short neck and high flow within the aneurysm. Similarly we were reluctant to consider a surgical intervention because of her acute deep vein thrombosis. Insertion of a covered stent (Fig. 2(b)) brought about immediate pain relief (6 × 30 mm Wallgraft, Boston Scientific Ltd, ballooned to 5 mm diameter). Over the ensuing five days, she was stabilised on warfarin and her leg swelling diminished significantly. Duplex ultrasound confirmed exclusion of the false aneurysm.

Discussion

Arterial perforation occurring during subintimal angioplasty rarely causes problems and in a recent audit of 52 perforations during 1532 limb angioplasties, all were successfully treated without surgical intervention and without compromising outcome.¹ In retrospect, however, we have never specifically differentiated between wire perforation and the much less

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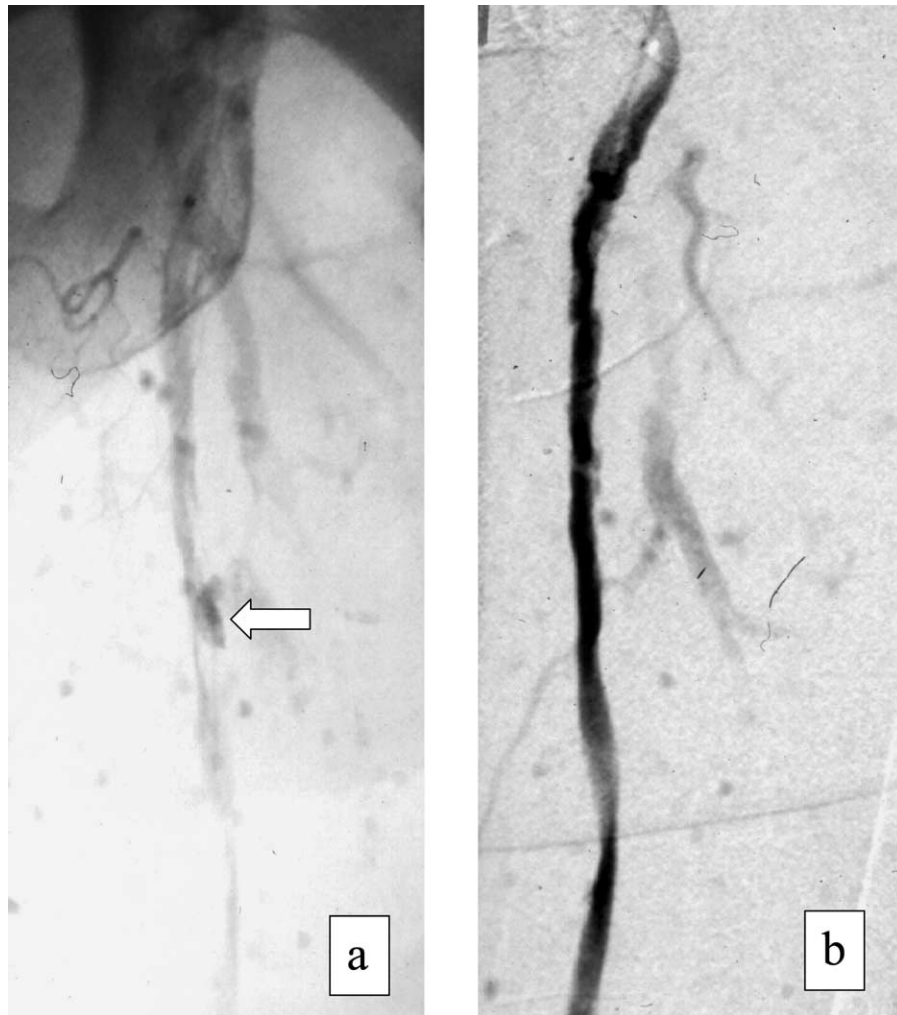


Fig. 1. (a) Perforation (white arrow) following balloon inflation of the sub-intimal channel successfully treated by balloon tamponade without compromising arterial flow (b).

common 'vessel tear' during balloon insufflation. It seems logical that arterial perforations following guidewire manipulation are more likely to stay sealed once treated. Relatively few cases of perforation occur during balloon inflation of the sub-intimal channel and this case is the first (in our experience) to have recurred. The case described, however, is different in that the original problem was almost certainly an extensive vessel tear rather than a localised perforation.

In the past we have never advocated ultrasound surveillance following perforation. In light of the current case, we would now recommend weekly

ultrasound surveillance for 3–4 weeks in any patient suffering a vessel tear caused by balloon insufflation within the subintimal channel.

References

- 1 HAYES PD, MORGAN R, BOLIA A, FISHWICK G, BELL PRF, NAYLOR AR. Arterial perforation during infrainguinal lower limb angioplasty does not worsen outcome: results from 1409 patients. *J Endovasc Ther* 2002; 9(4):422–427.

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Fig. 2. The patient was readmitted 3 weeks later with an extensive DVT secondary to compression by a wide necked false aneurysm 5 cm from the origin of the superficial femoral artery (a). This was successfully excluded by insertion of a covered stent (b).